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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/286,160 04/05/99 BRUNING

T PD26112

EXAMINER

TM02/0319

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MCLEAN, K	
ART UNIT	PAPER NUMBER

2185 *3*

DATE MAILED:

03/19/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No. 09/286,160	Applicant(s) BRUNING
	Examiner Kimberly McLean	Group Art Unit 2185

Responsive to communication(s) filed on Apr 5, 1999

This action is **FINAL**.

Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

Claim(s) 1-20 is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

Claim(s) _____ is/are allowed.

Claim(s) 1-20 is/are rejected.

Claim(s) _____ is/are objected to.

Claims _____ are subject to restriction or election requirement.

Application Papers

See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

The drawing(s) filed on _____ is/are objected to by the Examiner.

The proposed drawing correction, filed on _____ is approved disapproved.

The specification is objected to by the Examiner.

The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

All Some* None of the CERTIFIED copies of the priority documents have been

received.

received in Application No. (Series Code/Serial Number) _____.

received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____.

Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

Notice of References Cited, PTO-892

Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

Interview Summary, PTO-413

Notice of Draftsperson's Patent Drawing Review, PTO-948

Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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DETAILED ACTION

1. The enclosed detailed action is in response to the Application submitted on April 5, 1999.

Specification

2. The abstract of the disclosure is objected to because:

The abstract contains acronyms without first defining the acronym. For example, RAID (redundant array of inexpensive disks). Correction is required. See MPEP § 608.01(b).

3. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 U.S.C. § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 3-4, 6 and 13-15, 17-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Massiglia, The RAID Book.

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Massiglia discloses a computer (host computer (inherent); Page 6); a plurality of disks (Page 151, Figure 73; Page 153, Figure 74); a back-end controller (RAID engine) coupled to the disks via ports (plurality of busses) which are each coupled to one and only one of the disks for organizing and presenting the disks as a plurality of redundant arrays of disks (Page 151, the lower Array Management Function; Page 153 the mirroring Array Management Function); a front-end controller (stripe engine) coupled to the back-end controller for striping the redundant arrays of disks and presenting the striped array as a virtual volume (Page 151, upper Array Management Function; Page 153, striping Array Management Function).

Claim Rejections - 35 U.S.C. § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 2, 5, 7, 16 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Massiglia, The RAID Book.

Regarding claims 5, 7, 16 and 20, Massiglia discloses the features cited above in claims 4, 6, 15 and 19, however, Massiglia does not explicitly disclose the RAID engine presenting the plurality of disks as a plurality of RAID-5 sets. Massiglia does teach that a RAID 5 provides a simple

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mechanism for providing data protection bit-by-bit parity (Page 102, 1st Paragraph). This feature provides reliability. One of ordinary skill in the art would have recognized the benefits provided by a RAID 5 system and would have been motivated to use a RAID 5 system with the teachings of Massiglia (with respect to the limitations cited above) for the desirable purpose of increased reliability.

Regarding claim 2, Massiglia discloses the limitations cited above, however, Massiglia does not explicitly disclose one or more of the plurality of disks as spare disks. Official notice is taken that it is well known in the art to include spare disk in a RAID system to replace a failed disk. This feature allows the RAID system to maintain its level of performance and reliability by replacing the failed disk with a new disk so that mirroring and striping may still occur. Therefore, it would have been obvious to one of ordinary skill in the art to include spare disk with Massiglia's teachings for the desirable purpose of improved performance and reliability.

8. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Massiglia, The RAID Book in view of Filgate (USPN: 6,178,521 B1).

Regarding claim 8, Massiglia discloses a back-end controller configured to organize and present X N-member RAID sets, and having N busses (ports) capable of supporting X + 1 disks (Page 151, the lower Array Management Function; Page 153 the mirroring Array Management Function); a plurality of groups of X+1 disks, each group being coupled to one of the back-end

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controller busses (Page 151, Figure 73; Page 153, Figure 74); and a local front-end controller coupled to the back-end controllers for receiving the RAID sets as members, striping the member RAID sets, and presenting the striped RAID sets as a virtual volume (Page 151, upper Array Management Function; Page 153, striping Array Management Function). Massiglia does not explicitly disclose a plurality of back-end controllers. However, Filgate discloses the concept of plural back-end controllers to provide a disaster tolerant system (Figure 3, References 340 and 380; C 3, L 14-33; C 4, L 36-48; C 6, L 8-35). One of ordinary skill in the art would have recognized the benefits of Filgate's teachings and would have been motivated to use such teachings with the teachings of Massiglia for the desirable purpose of reliability.

9. Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Massiglia, The RAID Book in view of Filgate (USPN: 6,178,521 B1) as applied to claim 8 and further in view of Matoba (USPN: 5,611,069).

Regarding claims 9 and 11-12, Matoba discloses a controller which performs mirroring and striping on RAID sets (C 11, L 29-65) which provides improved performance. In Massiglia's teachings mirroring is performed via a lower Array Management Function and striping is performed via an upper Array Management Function. In the event of a failure of the lower Array Management Function, Massiglia's system will no longer provide mirrored data. Therefore, it would have been obvious to one of ordinary skill in the art to provide a front end controller which performs data mirroring and striping for the desirable purpose of improved performance and

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reliability. Additionally with regard to claims 11 and 12, Filgate teaches the concept of local and remote controllers for increased reliability. It would have been obvious to one of ordinary skill in the art to use redundant (local/remote) front-end controllers in the system taught by Massiglia for the desirable purpose of increased reliability.

Regarding claim 10, Filgate teaches the concept of providing multiple controllers (primary local and primary remote) for improved performance and reliability (Figure 3, C 6, L 8-35). For the same reasons it is desirable to have a primary local and primary remote controller, it would be desirable to provide additional redundant controllers (redundant local, redundant remote, cloning) for increased reliability. It would have been obvious to one of ordinary skill in the art to provide redundant local, redundant remote and cloning controllers to the teachings of Massiglia for the desirable purpose of increased reliability.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Micka et al. - USPN: 6,148,383 - redundant controllers.

Hubis et al. - USPN: 6,182,198 - redundant controllers.

Thowe - USPN: 6,115,788 - redundant controllers.

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11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kimberly McLean whose telephone number is (703) 308-9592 (e-mail address: Kimberly.McLean2@uspto.gov). If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Do Yoo, can be reached on (703) 308-4908.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 305-3900.

Any formal response to this action intended for entry should be mailed to Commissioner of Patents and Trademarks, Washington, D.C. 20231 or faxed to (703) 305-9051 and labeled "FORMAL" or "OFFICIAL". Any informal or draft communication should be faxed to (703) 308-6306 and labeled "INFORMAL" or "UNOFFICIAL" or "DRAFT" or "PROPOSED" and followed by a phone call to the Examiner at the above number. Hand-delivered responses should be brought to Crystal Park II, 2021 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).

KNM

March 15, 2001

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